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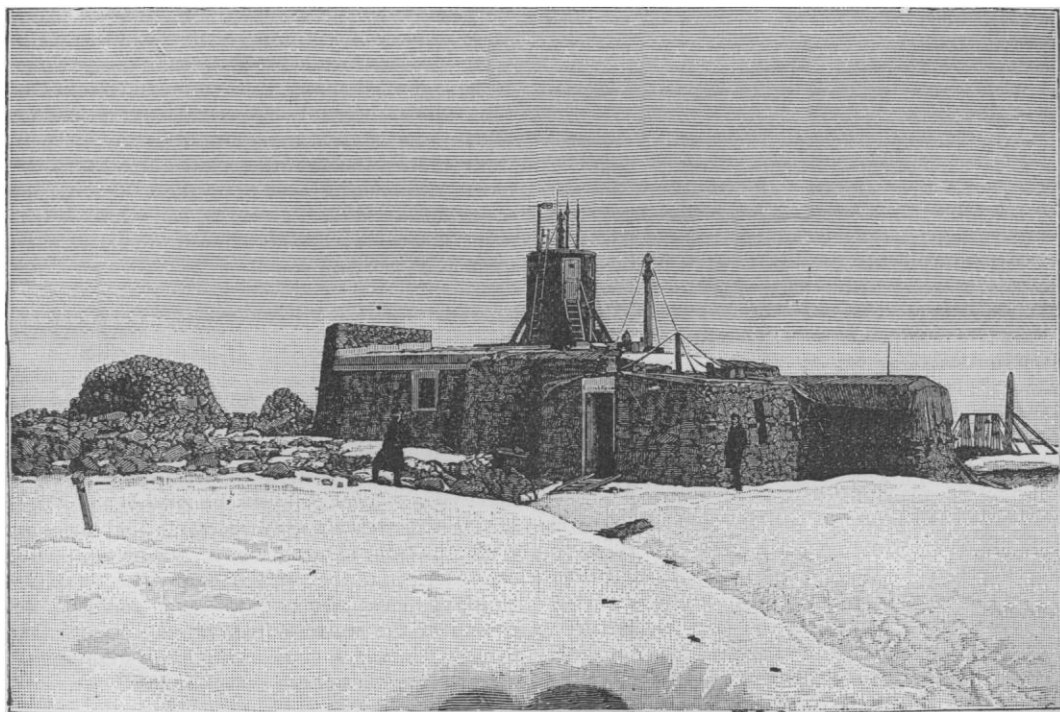
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them have the peculiarity of being immediately by the sea, and none are so frequently visited by storms. Hourly observations of the usual meteorological elements are taken by Mr. Omond, the superintendent, and his two assistants; and, if the observatory be maintained as well as it has been begun, its records must yield results of the greatest value in the study of the weather. Unfortunately, its support still depends only on general subscription. Among the generalizations thus far made for Ben Nevis by Mr. Buchan, secretary of the Scottish society, we may quote the following:

are prevailing cold, on account of the rapid loss of heat by radiation from the ground through the clear, dry air. Mountains, therefore, have a meteorology of their own, and one that is well worth studying.

#### THE ORIGIN OF MEDIAEVAL UNIVERSITIES.

AN important contribution to the history of higher education has been made in Germany by the publication of a work<sup>1</sup> on 'The mediaeval uni-



BEN NEVIS METEOROLOGICAL OBSERVATORY. (London graphic.)

The mean velocity of the wind is greater at night than at day, this being the reverse of the variation found at low-level stations, but in accordance with the results of other mountain observatories and with theoretical deductions; diurnal variations of temperature are small, the change from warm to cold weather being very largely dependent on the passage of cyclonic storms; the temperature is abnormally high during the passage of an anticyclone, or area of high atmospheric pressure, in which the air descends from great altitudes, and is warmed by compression; this, like the variation of the wind, being the reverse of what obtains at lower levels, where anticyclones

versities prior to 1400.' Its author is *unterarchivar* of the papal see, P. Heinrich Denifle, and he has brought the thorough methods of research which are characteristic of the Germans to the discussion of the ample stores of information which are to be found in the archives of Rome, Florence, Paris, Leipzig, Munich, Erlangen, and other ancient seats of learning. The volume before us includes more than eight hundred pages, but it is only one-third of the proposed work. It discusses the origin of the universities in the middle ages; and their organization and constitution are to be considered

*Die universitäten des mittelalters bis 1400.* Von P. HEINRICH DENIFLE. Band i. Berlin, Weidmann, 1885.

in the second part, and in the third many subordinate subjects. Our space will not allow us to do justice to the erudition of this great work, but we can, perhaps, exhibit its scope so that those who are interested in the circumstances which gave birth to the progenitors of our modern institutions may understand how rich a storehouse of learning has been provided for them.

The writer begins with the study of the now venerable words, *studium generale* and *universitas*. Both terms were in vogue as early as 1300. The former phrase has not been found in use as the name of a high school prior to 1233-34, when it is applied to the school of Vercelli: the phrase *studium universale* is a little older. *Universitas* (as other writers, following Du Cange or the lexicographers, have pointed out) had originally no special reference to a seat of learning. It signified very nearly what we call a corporation, and was almost synonymous with such words as *societas*, *collegium*, *corpus*, *communio*, *consortium*. Gradually it came to be employed for the corporation devoted to the pursuit of knowledge, and then was restricted to this use, so that *universitas oxoniensis* was interchangeable with *studium oxoniense*; but the proper designation of a mediaeval high school was *studium generale*, or *studium* alone. As early as 1254, the word 'university' is used in Paris as equivalent to 'college.' The definition of Hugolinus is worth quoting: 'Universitas est plurium corporum collectio inter se distantium uno nomine specialiter eis deputato.'

From this preliminary inquiry, the writer proceeds to the history of the universities of Paris and Bologna, which, in his view, require more elaborate treatment than the other high schools, not only because of their extraordinary direct influence, but because their constitution is the key to that of many later foundations. The school at Salerno, older than the two just named, was quite subordinate in general influence. Savigny's theory that universities, by a sort of natural evolution, were developed around the chair of an illustrious teacher, is vigorously opposed by Denifle, who recognizes many factors as co-working in the origin of an enduring university. New methods of instruction, and privileges accorded by authority, seem to our author most potent influences; but even more important was the forming of corporations for the promotion of study, or, in other words, the introduction of combined or co-operative methods of instruction. The different modes in which such combinations were secured in Paris and Bologna are discussed at much length. After considering the origin of these typical foundations, in whose usages of five or six centuries ago may be found the germ of customs

and laws still recognized, even in the disjointed members of American universities, the author takes up, one by one, all the other European universities of the period he is considering. He makes four groups,—schools, improperly called universities; high schools without letters of authorization; high schools which were established by papal briefs; and high schools which received their privileges from papal and princely authority. Finally, the relation of universities to pre-existent schools is very fully discussed.

We have said enough to show that the writer is original, and to a considerable degree controversial. Whatever criticism his views may call forth,—and they are likely to be most closely scrutinized in Germany,—his diligence in the collection of facts, his comprehensive views, and his abundant references to original authorities, entitle him to the highest praise. There is good reason to think that he is right in claiming that the period he is discussing, instead of belonging to the age of darkness, is one of those epochs when the mind of man has received new impulses of unusual and persistent force.

#### THE WASHBURN OBSERVATORY.

THE third volume of the 'Publications of the Washburn observatory,' lately issued, gives the results of the work of 1884. About 1,800 observations were made with the Repsold meridian-circle upon the gesellschaft southern fundamental stars and the Leyden Cape of Good Hope refraction-stars. The instrumental constants are given for each observing day, and an investigation of the zenith-distance micrometer-screw and of the horizontal flexure of the instrument. In the cold winter weather of Wisconsin the micrometer-springs turned out too weak to pull the slides, and had to be replaced with stiffer ones. The probable error of a single declination is now reduced to 0".4, a great improvement over that noted in vol. ii.; and a correction of  $+0".30 \pm 0".026$  to the constant of the 'Pulkowa refractions' seems to be called for by the observations of 1884 to suit the atmosphere over Madison. Professor Holden expresses his continued satisfaction with the Repsold meridian-circle, and appears to be making a very thorough study of it; and in this his example might well be followed with profit by some of our older established observatories. Two determinations of the latitude by Mr. G. C. Comstock are given,—one from Professor Holden's and his own observations with the zenith-telescope, the other from his own with the prime-vertical transit, using both reflected and direct observations; the declina-